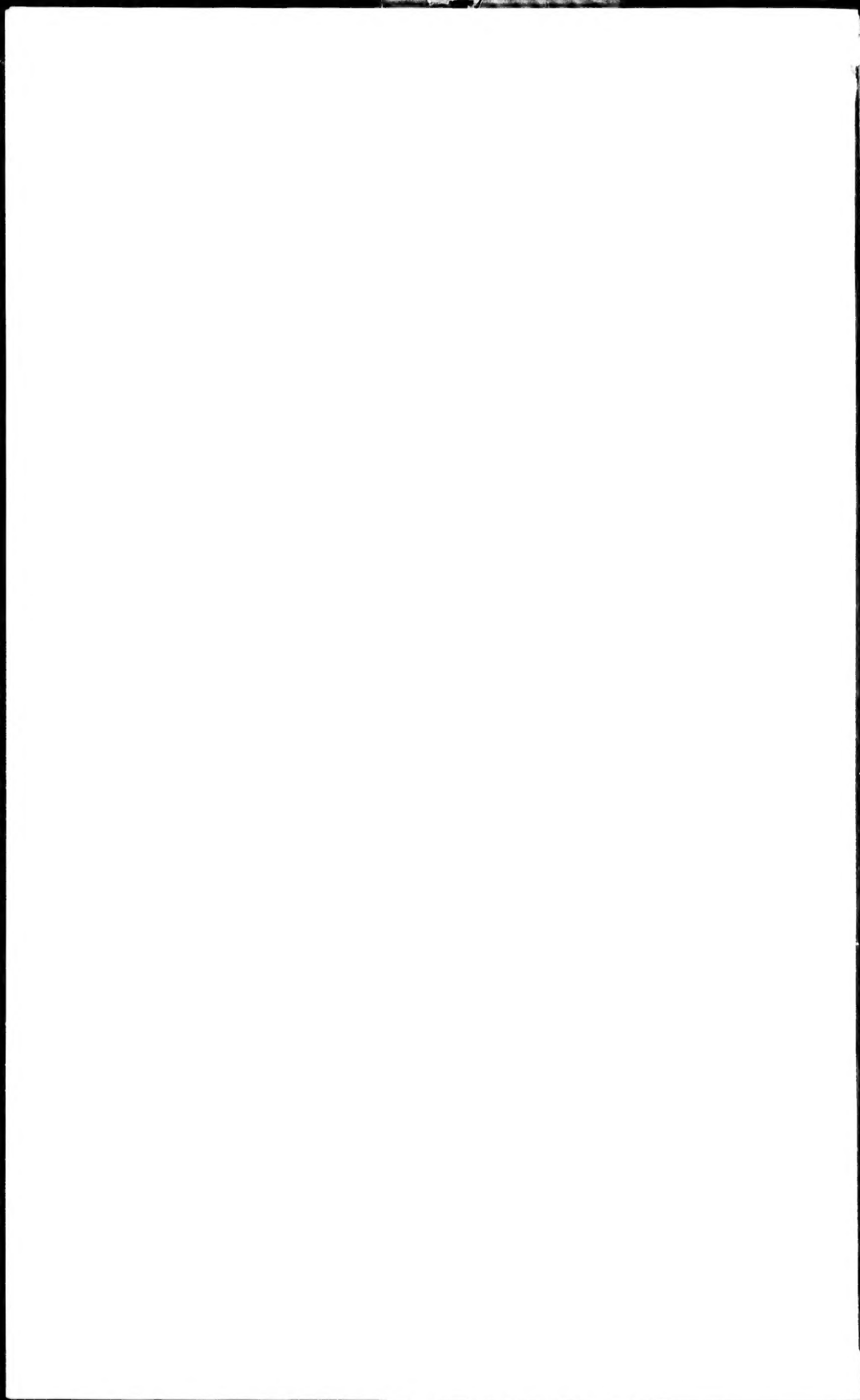




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HALIFAX AND QUEBEC RAILWAY.

REPORT

UPON THE

SURVEYS, ROUTES, AND ESTIMATES.

[THIRD EDITION.]

By A. L. LIGHT, M. INST. C. E.

Late Chief Engineer of Railways to the Province of New Brunswick.

WITH A MAP.

DECEMBER, 1891.

No. 5, VICTORIA STREET,

WESTMINSTER, S. W.

6th December, 1861.

HAVING devoted the last three months to a reconnoissance of the several routes for the proposed Intercolonial Railway, I have prepared the following remarks. They are not based upon an actual survey, but merely upon an examination of the ground at most of the difficult points, and also upon information obtained from records existing in the provinces; and from consultations with Messrs. Wightman, Wilkinson, and Ramsay, intelligent engineers residing in New Brunswick, who assisted Major Robinson in making his valuable survey; and, lastly, from my own experience in locating and constructing such works in the United States, the Canadas, and the lower provinces, extending over a period of 18 years, the last 11 years of which I have occupied the position of Engineer-in-Chief for three different railways in the state of Maine, New-Brunswick, and Nova Scotia, amounting in length to about 225 miles.

I offer then these suggestions, which, under the further light derived from instrumental surveys, may be considerably modified, and shall proceed to describe, as concisely as possible, the principal features of the main lines that have been severally proposed, stating the facts, without giving any opinion as to the line to be preferred.

Since the date of Major Robinson's "report," that portion of the line from Quebec to Rivière du Loup, and the section from Halifax to Truro, making together 170 miles, have been completed, leaving 470 miles yet to be constructed. Of this distance, the section from Truro to Bay Verte, 69 miles, is *common to all the lines*; but from this spot three lines have been proposed, which are severally depicted upon the accompanying map, which having been carefully compiled under the orders of the Provincial Government, is generally very reliable.*

The first of these routes—No. 1, "NORTH SHORE ROUTE," represented by the fine black line, was surveyed under the orders of Major Robinson, and particularly recommended by him in his admirable "report." It is quite practicable, is 470 miles in length, from Truro to Rivière du Loup, and will cost, according to my estimate, about £8,300 sterling per mile, or a total, say of £4,000,000 sterling.

* N. B.—The Map referred to, being too large for publication, has been deposited with the proper authorities, and is open to the inspection of those desiring more detailed information: it differs slightly, in the route of the "Central Line," from the one attached to this Report, which having been previously prepared, and being correct in every other particular, is sufficiently accurate for general purposes.

The second route, No. 2, "CENTRAL LINE," shown by a yellow line, is 418 miles in length, from Truro to Rivière du Loup, of which 396 miles only is to be constructed, which, at the above rate, will cost £3,286,800 sterling, and is, I have reason to believe, quite practicable.

The third route, "No. 3" dotted red on the map, is proposed to be carried along the European and North American Railway, westward across the St. John River to the intersection with the St. Andrew's and Quebec Railway, and thence, by an extension of that road, up the valley of the St. John, and by the Temiscouata or Squatooc lakes, to Rivière du Loup; the total distance is 532 miles, of which there will be required 355 miles of *new work*, which, at the above rate, will amount to £2,946,500 sterling. To this, however, must be added £3,000 per mile for improvements on 75 miles of the St. Andrew's and Quebec Railway (originally cheaply built) to bring it up to the same standard as the other roads, making £3,171,500 for this route.

RECAPITULATION.

North Shore Route, 470 miles		£3,901,000 sterling.
Central " 396 "		3,286,800 "
No. 3 " 355 "		£2,946,500
Add Improvements on 75 "		225,000
	————	£3,171,500 "

Having given this short synopsis, I now propose to describe more at length the three lines, pointing out the general features of the country, their advantages and disadvantages, with remarks upon the respective estimated cost, as well as the construction and time of completion; also upon the population and local traffic to be expected upon each.

TRURO TO BAY VERTE.

(Common to all the Lines.)

On this Section two lines have been proposed,—one crossing Cobequid Mountain at Folly Lake, the other at Earl Town; the first was surveyed in 1847 by George Wightman, C. E., and is described in Captain Henderson's Report. The mountain is about 12 miles across, and will cost, say £60,000 sterling more than the same distance on ordinary plain country. The grades on either side of the mountain will be about 60 to 65 feet to the mile. There will be six river-bridges of 100 to 150 feet span, besides brook crossings;

but no difficulties as regards foundations, and stone is abundant. With the exception of this mountain, the line will not be heavy, probably 35,000 yards of earthwork to the mile, cuts of 30 and embankments of 18 feet wide at formation level.

The other route makes a *détour* to the eastward, and is about 14 miles longer than the former, but will probably not cost more for grading and masonry, owing to an easier crossing of the Cobequid. The grades will be easy, except upon the north side of the mountain, from Earl Town to Tatamagouche, where there will be about 7 or 8 miles of 50 to 60 feet per mile, down a straight valley.

The former of these routes has steeper grades in general, and will be entirely inland; the latter will be more level, probably within 30 feet to the mile, excepting the 60 feet grade on the descent of the mountain at Earl Town. It will also touch upon navigable water at Wallace, River Philip, Pugwash, and come within five miles of Tatamagouche; and through these ports, connect with Prince Edward Island. The present population to be accommodated is 80,000 on Prince Edward Island, and 10,000 in Nova Scotia, which are increasing in a compound ratio of 2½ per cent. annually. The eastern route passes within 30 miles of Pictou coal mines, and, when that branch is made, the coal traffic and the traffic of some 50,000 additional inhabitants will come upon the road between the junction of the branch and Halifax.

By carrying the road the *western* route (Folly Lake) the traffic of this population will be lost to the road.

The *eastern* route also brings several of the northern harbours into connection with Halifax, and will encourage the formation of a population, that would, in a few years, command, by their shipping, a considerable portion of the fisheries of the gulf, and of the trade of the far west in heavy articles. These advantages will be lost by taking the western route.

The space between Bay Verte and the European and North American Railway near Shediac is common to either of these lines, and contain no difficulties.

THE SEVERAL ROUTES FROM BAY VERTE TO RIVIERE DU LOUP.

Proceeding onwards towards Quebec, several routes have been examined with more or less care, which may be described in the following order:—

No. 1. North Shore Route, the line recommended by Major Robinson, running by Bay Chaleur and the Metapedia; designated on the map by the

fine black line. This route crosses the Miramichi, and through a low valley to the Nepisiquit; thence down that river to Bathurst; thence along the coast of Bay Chaleur to the Restigouche, to 12 miles above Campbellton; thence across a mountain-range by the valley of the Metapediac; and thence up the St. Lawrence to Rivière du Loup, where it meets the Grand Trunk of Canada.

Remarks.—The line, as drawn between Shediac and the Miramichi, crosses the heads of the streams flowing toward the Gulf, and runs across swells of ground between them. By moving the eastern part of it (Shediac to the "Oxbow" of Salmon River) 4 or 5 miles more to the southward, on the table land at the heads of the said streams, it would probably occupy more level ground.

From the Oxbow to Indian Town on the Miramichi, the general character of the country is that of a low table land; and it is not probable that any material difficulties exist on that part.

Immediately on passing Indian Town, there is a ridge of some 300 feet in height, which, according to Major Robinson's report, may be turned by making a *détour* to the westward.

Proceeding up the North-west Miramichi, the country near the river is quite level. The ground between this river and the Nepisiquit, upon which the line is marked, is a low valley, rising about eighty feet in the centre, and can be passed by grades of 20 feet per mile; thence there is but little difficulty in following the Nepisiquit and the coast of Bay Chaleur up to the point of land upon which Dalhousie stands; which, if found to be too steep to cross conveniently, may be turned by following the shore. From this place to the mouth of the Metapediac, 12 miles above Campbellton, the line is comparatively level along the margin of the Restigouche; it then goes up the valley of the Metapediac, is continued for about 17 miles on the descent of the mountain on the northern side, in both of which places there will be heavy work. The remainder is comparatively level ground to Rivière du Loup.

The formation of the country is such, that this line cannot be deviated from to any material extent except between Shediac and the Miramichi. On this section it might, if considered desirable, be carried near the post road connecting with the small harbours along the coast, touching upon Chatham at Miramichi, and upon the head of the harbour a few miles above Newcastle. It might cross the river a little above the "Forks," run up the south side of the North-west Miramichi, and join Major Robinson's line at the mouth of the

The advantages of the North Shore route are, that in a military point of view it would keep clear of the American boundary, that it would touch upon all the principal harbours, and encourage the fisheries of the Gulf; while at the same time, pass through a fair agricultural country. Its disadvantages are, that it is 52 miles longer, has 71 miles additional road to construct and will probably cost £600,000 sterling more than the Central line.

No. 2. Central Route.—This line (shown by a yellow line) would branch from the European and North American Railway at a point about 10 miles westward of Moncton, and proceed over a tolerably level country, as straight as the ground will permit, to Boiestown on the South-west Miramichi. Thence over a country which has not been fully explored, but is known to contain no material obstacles, to the Miramichi lake, about 30 miles west of Boiestown; thence a line was surveyed and levelled, by order of Major Robinson, across the valley of the Tobique to the Restigouche. This is described in his report (page 36) as a rather heavy line, though quite practicable. At the head of Boston Brook, or possibly still further south, it may be turned off to the westward, cross the Wagan Portage, and pass along the southern base of the mountain to the River Little Madawaska at Edmonston, thence up that river, and along the shore of Taminiscouta Lake to its eastern extremity, and thence to the St. Lawrence by the Trois Pistoles; the section along the shore of the lake, from its precipitous character, will be heavy. The portion of the country from the Restigouche to Rivière du Loup has never been properly explored; and I think it very probable, that by going up the north branch of the Restigouche, thence by Green River, and crossing into the valley of the Squatecock lakes, good lines may be obtained at less expense, and further removed from the American boundary.

The advantages of the Central route may be summed up as follows:—

First. It is 52 miles shorter than the North Shore road, of which 22 miles run on the European and North-American Railway, making the road to be constructed less by 74 miles; the cost per mile being about the same.

Second. It will be the most popular in New Brunswick; by passing through the centre of the province it will in a considerable degree combine the different interests, and by 42 miles of a branch road (dotted on the map in red), it may be connected with the present St. Andrew's and Quebec Railway, and this again by the western extension of the European and North American Railway with St. John.

Third. It will run through a block of Crown land between the Tobique and Restigouche Rivers, of near 1,000 square miles, at least two-thirds of

Little South-west. This line would be 10 miles longer than the former, but would promote the growth of fishing and trading villages at the harbours. The agricultural capabilities of the soil are much the same on either line.

which is fit for settlement, which probably would be filled up within 20 years. On other parts of the line, also, between the Tobique and Shédiac, there is probably an equal quantity of Crown land; whereas, on the North Shore line, the quantity of Crown land of good quality is not very large.

The disadvantages are,—First. The proposed line will have a greater aggregate length of steep gradients, although *some* gradients on the North Shore route will be equally steep as on this. Second. It runs for about 18 miles near Edmonston within a few miles of the United States boundary. This difficulty, however, may be obviated by further exploration.

No. 3. St. John River Route.—It is proposed by this scheme to carry the road (dotted red) from Truro to the intersection of the European and North American Railway near to Shédiac on the same line as in the former case, then follow that road to St. John, and continue in a line suitable for the extension of the same to its intersection with the St. Andrew's and Quebec Railway, then follow that Railway to Scotch Corner, its present termination; thence proceeding up the valley of the St. John to the mouth of the Little Madawaska at Edmonston, thence by the valley of the Madawaska and Tamiscouta Lake, and by the Trois Pistoles to the St. Lawrence, and thence up the St. Lawrence to Rivière du Loup.

From St. John to the intersection of the St. Andrew's and Quebec Railroad will be a continuation of the European and North American Railway, for which two different routes have been proposed:—one, which may be called the Northern, or Douglas Valley route, making a *détour* towards Fredericton, and passing to the north of the Oromocto Lake; the other, which may be called the Southern, route, passing near the village of St. George, and crossing the St. Andrew's and Quebec Railway about 15 miles from St. Andrew's. Which of these routes will be preferred is at present uncertain. The Northern will give a less distance from St. John to Quebec than the Southern, by twelve miles; and will lengthen the distance to Bangor, in the United States, 26 miles; but will have less advantage of the St. Andrew's and Quebec Railway, by 30 miles.

The advantages of No. 3 (St. John River) route are, that it takes in the railways already constructed, requiring 41 miles less *new work* than by the Central, and 115 miles less work than by the North Shore line. The disadvantages are that it exceeds the length of the North Shore line by 62 miles, and the Central line by 114 miles; and that from its junction with the St. Andrew's and Quebec Railway to Edmonston, 179 miles, it runs near to the United States frontier.

DISTANCES BY THESE ROUTES FROM TRURO TO RIVIERE DU LOUP.

No. 1.—MAJOR ROBINSON'S NORTH SHORE LINE.

	Miles.
Truro to Bay Verte.....	69
Bay Verte to Shediac.....	26
Shediac to Indiantown, Miramichi River.....	74
Indiantown to Bathurst.....	56
Bathurst to Dalhousie.....	48
Dalhousie to mouth of Metapedia River.....	30
Metapedia to Naget River, branch of the Metis.....	86
Naget River to Rivière du Loup.....	81
Truro to Rivière du Loup.....	470

No. 2.—CENTRAL ROUTE.

Truro to Bay Verte.....	69
Bay Verte to intersection of European and North American Railway.....	24
Along European and North American Railway.....	22
Thence to Boiestown.....	75
Boiestown to Miramichi Lake.....	30
Miramichi Lake to Wagan Portage.....	75
Wagan Portage to Edmonston.....	27
Edmonston to Rivière du Loup.....	96
	418
Deduct road already made.....	22
Road to be made.....	396

No. 3.—ST. JOHN RIVER ROUTE.

	Miles.
Truro to Bay Verte.....	69
Bay Verte to intersection of European and North American Railway.....	24
Along said European and North American Railway to St. John.....	102
St. John to intersection of St. Andrew's and Quebec Railway	62
Along St. Andrew's and Quebec Railway to Woodstock.....	75
Woodstock to Grand Falls.....	65
Grand Falls to Edmonston.....	39
Edmonston to Rivière du Loup.....	96
	532
Of this 75 and 102 miles are already made.....	177
Road to be made.....	355

Note 1.—I may here state that to connect St. John with Quebec by means of the Western extension of the European and North American Railway, and the St. Andrew's and Quebec Railway, the distance would stand thus:—

THE ESTIMATE.

I have arrived at the estimated sum of £8,300 per mile from a generally accurate knowledge of the greater portion of the ground that will be traversed by all these routes, and by particular examinations of the most difficult portions of each; and have been guided in my judgment by the actual costs of the completed Railways through a similar country in New Brunswick and Nova Scotia, the former of which were chiefly constructed, as already stated, under my immediate superintendence.

	Miles.
St. John to intersection of St. Andrew's and Quebec Railway,)	62
Southern Route.....)	
Along St. Andrew's and Quebec Railway to Scotch Corner....	75
Scotch Corner to intersection of Intercolonial at North Branch)	42
of Miramichi.....)	
	179
Of which is already made.....	75
Leaves to be made for this connection.....	104

This is upon the supposition of the Central route of Intercolonial Road being adopted. Assuming this, and carrying the St. Andrew's and Quebec line across the river St. John, near the Presquile and Beccaquimic rivers, into it at Miramichi, and taking the Southern route for the European and North American line towards Bangor, we require of new road at the present to complete the whole system within the Provinces, as follows:—

	Miles.
Halifax and Quebec Line, Central Route.....	396
St. John, <i>via</i> European and North American Railway and St.)	
Andrew's and Quebec ditto, to intersection at Miramichi,)	104
as above.....	
From intersection to St. Andrew's and Quebec Railway to Calais	15
Whole new road required to complete systems;)	
viz., Halifax and Quebec, European and North)	515
American, and connect St. Andrew's Railway)	
with the Intercolonial.....	

Being only 45 miles longer than the North Shore route alone. The Central route avoids the United States frontier, except about 18 miles near Edmonston. It is probable that further explorations may show a line across the mountain, from Boston Brook to Trois Pistoles, as already stated, which would avoid the frontier entirely, without increasing the distance.

Note 2.—A modification of the Central line has been spoken of, and is popular in St. John: it is to continue on the line of the European and North American Railway as far as Sussex Vale, and there turn off to Boiestown. If this can be done successfully, which I do not doubt, it would branch from the European and North American Railway 38 miles nearer St. John, and add 38 miles to the distance going *easterly*; the length of new road being about the same in both cases. This supplementary line is dotted on the map in red.

The distance from St. John to Quebec, *via* Sussex, would be about 30 miles shorter than by the way of the St. Andrew's and Quebec Railway, as will be seen by the following table:—

I have applied the same price per mile to all the roads, because the difficult portions of each, and not common to all, are very similar, and would about balance each other; and while portions of the grading on the North Shore line will be lighter than on the Central, yet the expensive bridges over the large rivers—the Miramichi, Nepisaguit, and Restigouche—with the heavy grading of the Metapediae, will be a considerable offset against the difficulties anticipated on the partially explored Central line at the valley

	Miles.
St. John to Sussex Vale.....	45
Sussex to Boiestown.....	74
Boiestown to Rivière du Loup.....	228
	347
	Miles.
St. John to St. Andrew's and Quebec Railway.....	62
Thence to Scotch Corner.....	75
Branch from Scotch Corner to Central Line at Miramichi)	12
River)	
Miramichi River to Rivière du Loup.....	198
	347

No. 3—OTHER ROUTES.

The three routes marked in strong red on the map may be termed the principal. They are known to be practicable. There are, however, some other lines which appear very feasible, but have not yet been surveyed, which, if found practicable, would be an improvement upon those already described.

The first of these that has been suggested is a line branching from Route No. 1, at Indian Town, Miramichi, running westward, and falling into the valley of the Little South-west Miramichi, touching on Long Lake, at the head of Campbell River, a branch of the Tobique; thence down that stream, and up the Sisson branch of the same river, and thence across the country to Boston Brook, where it will join Route No. 2.

The length of this line, from Indian Town to where it meets Route No. 2 at Boston Brook, is 98 miles. The distance from Bay Verte to the Wagan Portage by Route No. 2 is 226 miles. Between the same points, by way of Indian Town and the route in question, is 208 miles, showing difference in favour of the latter route of 18 miles.

This route has not been explored; but it looks favourable, and there is reason to think that it runs over a practicable country. From a short distance up the Little South-west River to the mouth of Sisson branch, nearly 60 miles, it runs, however, through a portion of barren country. It ought most certainly to be examined previous to fixing upon the final location of the road.

of the Tobique river, and which I think more extended examinations will materially reduce. Again, the expense of portion of Route No. 3 from St. John to the intersection of the St. Andrew's and Quebec Railway, and from Scotch Corner to Grand Falls including the three bridges over the Aroostock and St. John rivers, will be quite as heavy as the Central line.

Second.—The Route No. 2 from Boiestown to the head of Two Brooks on the north of the Tobique, makes a considerable *détour* to the westward; and the pass through the top of the ridge south of the Tobique is 831 feet above that river, where it is crossed by the line. It is desirable that the line should be more direct, and the pass through the mountain at a lower level. It is quite possible that such a pass may exist to the eastward of the present route.

As a case in point, it may be stated that extended explorations made by the American topographical engineers, more to the westward, through American territory, have discovered two or three such passes through the same mountain-range, along one of which the Atlantic and St. Lawrence Railway is now located.

A series of levels taken for 26 or 49 miles eastward from the present line along the top of the mountain-range would determine this question, and ought to be so taken before the final location of the road. It must be particularly borne in mind, that this part of the country has never been surveyed at all, and is left blank on the map. Were a tolerably direct route discovered, the distance gained would probably be from 10 to 15 miles.

Third.—A route proceeds from Boston Brook, on the Restigouche, directly across the mountain to Trois Pistoles, as shown by the most easterly dotted line on the map. This has been partially explored by Mr. Wilkinson, C. E. (*vide* his report.) If it should be found practicable for a railway, it will probably, as compared with the line by Temiscouata Lake, have steeper gradients, require heavier works of construction, have less cultivable land upon it, and save but little in distance. Its only recommendation is the greater distance from the frontier of the United States.

Fourth.—The intermediate dotted line passing up the north branch of the Restigouche, thence by way of Green River and the Squatoek Lakes and the east branch of the Trois Pistoles, and gradually descending to the St. Lawrence along the northern slope of the mountain to Rivière du Loup, as already mentioned in this Report, appears much more promising, and is particularly recommended to be carefully explored.

Fifth.—The deviation in Nova Scotia by Earl Town. This will add 14 miles to the length of the road; but the benefit to be derived will far over-balance the disadvantage, as has been shown under the description of Route No. 1. Besides, this line is more level than that by Folly Lake; and this will give it an advantage in working that will counteract in some measure the effect of difference in length.

Sixth.—The deviation of Route No. 1 between Shediac and Miramichi by the coasts has been already noticed. The increase of distance is about 10 miles, and it would probably be more hilly than the interior line. Here connections with the harbours would not produce so great an effect as in

The actual cost of the European and North American Railway from St. John to Shediac, passing over a country very similar to that traversed by the Central line, was £8,300 sterling per mile. The average cost of the Nova Scotia Railways, of 98 miles through a more difficult country generally than the average of either of these lines, was £9,090 sterling per mile. These railways were completed under Provincial Commissioners, and it may be presumed that a responsible company would execute similar work in quite as economical a manner.

The estimate contemplates doing the work in a good and substantial manner, and I am *perfectly confident* it is amply sufficient for the purpose.

Major Robinson's estimate of £7,700 sterling per mile, or even less than this, would complete the road with a more economical kind of work than is here contemplated. Wooden bridges, and many other means of economy, well known in the United States, can be adopted, by which the *first cost*, would be materially lessened, and the road still be sufficiently efficient for the present use, and can be improved as the business increases.

The first 40 miles of the St. Andrew's and Quebec Railway was principally built under my supervision for less than £5,000 sterling per mile, and was quite capable of doing a considerable business. Of course, the repairs upon such a road will be much greater than upon one more permanently constructed.

NOTES UPON CONSTRUCTION AND TIME OF COMPLETION.

In the event of the adoption of the Central route, it is recommended that so soon as the location of the line is defined, a common wagon-road should at once be constructed along or near the whole length of the proposed railway.

Roads suitable for the purposes of local traffic are made through the forests

the corresponding deviation in Nova Scotia, and would not be attended with so great an advantage. This line would cross the South-west Miramichi near the falls, above Newcastle, where the river looks very formidable, owing to broad shoals; but the quantity of water passing is very little greater than at Indian Town, the addition being only that of Barnaby's River, which drains an area of not more than 200 square miles. From measurements taken of the stream in 1847 at Indian Town, it may be concluded that a clear waterway of 800 feet wide by 20 feet deep, will be quite sufficient; the remainder of the width may be embanked. This would avoid the ridge between Indian Town and the Little South-west, and keep nearly upon the level of the rivers all the way to Bathurst.

If it be considered more proper to follow Route No. 1 as marked, the navigable water of the Miramichi above Newcastle may be reached by a branch of about 10 miles in length, and probably this would be the better plan of making that connection.

of New Brunswick, exclusive of the larger bridges, for about £100 sterling per mile. As this road must be rapidly executed, and of a rather more substantial character, £300 per mile will not be too large a sum to estimate for it when complete. It is unnecessary to say that the first cost of this road would be saved by the increased facilities afforded by it; in fact, it becomes necessary to the proper prosecution of the works, for delivery of contractor's stores, plant, and materials; and its construction will, in a great measure, do away with the charge of "impenetrability," so justly urged by Major Robinson, R. E., against the "central line."

After the railway is completed, this road will still be very advantageous for the settlement of the country, and to afford communication between the different stations. These remarks only apply in full force to the season of summer; for, during a period of about four months in winter, when the swamps, lakes, and rivers of these regions are frozen solidly over, they can be, and are traversed with facility in every direction by the heavy teams of the lumbermen by means of roads made by themselves, at a cost of about £10 per mile; their construction merely involving the clearing away the small brush, the removal of fallen logs, and the treading down of the snow.

Should the North Shore line be adopted, from its accessibility to the sea at so many points; and the existing roads running parallel thereto, additional communication will not be so much required.

The final completion of the Railway works in an economical manner will require a period of at least three summers, although, in the case of extraordinary requirement, the railway might be temporarily opened for an especial purpose in two seasons, by adopting a process (often used in America, especially through a wild country) of excavating the cuttings, and carrying forward embankments at a minimum width and slope, filling the deep valleys and stream crossings, and other heavy points, with cheap temporary trestle work, constructed of the round unhewed trunks of the spruce and pine-trees, an excellent description of which, admirably adapted for the purpose, everywhere abounds in close proximity to this line. Upon this foundation, the rails could be laid, and the railway *safely* and expeditiously opened. The earthwork subsequently required to fill in these places, as well as to complete the slopes of excavation and embankments, to be afterwards conveyed upon this track by means of locomotive power. Stone for the several bridges and structures remaining incomplete would likewise be conveyed by the same means; and their subsequent completion need not necessarily interrupt the passage of the trains.

This shorter period may be even still further reduced by omitting altogether the railway track, over some of the heaviest points of the line, say at the Cobequid, Tobique, Restigouche, and St. Lawrence mountain-ranges, substituting, temporarily, in lieu thereof, the wagon-road already mentioned at these points, over which, in case of necessity, troops could be marched

and munitions of war easily carted; by this means, some five-sixths of the whole distance could be traversed by rail within some eighteen months of the time its position *had been defined*. In this case, however, in order to make the season of 1862 fully available, it is of great importance that the surveys should be immediately commenced, and completed in the shortest possible period, and the present winter (when, as before stated, the forest can be penetrated in every direction) should be taken advantage of to convey stores, plant, and material to all points of the line.

As the adoption of either of these time-saving processes would involve extra expense, they are only submitted as alternatives in case of absolute necessity.

POPULATION AND LOCAL TRAFFIC.

The prospect of local traffic upon these lines may be as follows:—

No. 1.—This runs through a partially settled country from Truro to Shediac, but as the land is nearly all in private hands, no very great accession to the present population may be expected for some time to come. The eastern line (see page 2) would, by making easy access to Halifax from the waters of the Gulf, probably have within a few years many times the amount of local traffic that would be on the western route by Folly Lake.

From Shediac to Indian Town, probably three-fourths of the land is still in the hands of the Crown, and is of fair quality; if kept out of the hands of speculators it may be expected to fill up rapidly with settlers, who will contribute to the revenue of the road.

From Indian Town to the Metapediac, the land is of good quality with the exception of about 20 miles on the North-west Miramichi, where it is of a gravelly nature. The greater part of it is in private hands, and the present population can hardly be expected to increase at a very rapid rate.

From the mouth of the Metapediac, the southern face of the mountain is rather steep for cultivation; but on the top there is a great breadth of table-land that has always been called excellent soil, and the reason given for the want of settlement is its inaccessibility; this land would soon fill up with inhabitants, and they would be entirely dependent upon the road for their traffic.

From the Metis to the Rivière du Loup, the country is thickly inhabited by an almost exclusively French population. The road would cause a considerable increase of inhabitants; but the breadth of country likely to be affected by it is not very great.

No. 2. *Central Route*.—The part of this line from the European and North American Railway to Boiestown is over a country very similar to that

traversed by line No. 1, from Shediac to Indian Town. The distance, and the proportion of Crown land, is about the same; the remarks upon that will apply equally to this.

From Boiestown to Edmonston, a distance of 130 miles, at least three-fourths of the land is fit for settlement; it is still in the hands of the Crown, and the soil is very good. If properly managed, it might, in ten or fifteen years from the completion of the Railway, have a population from 20,000 to 30,000 persons within ten miles of the road, which population would be dependent on the road for their traffic.

From Edmonstone to Rivière du Loup, there are few inhabitants. The land is of mixed quality,—some bad, and some very good; the latter of which, the completion of the road would tend to settle.

No. 3.—This line is altogether through a partially settled country, with the exception of about 40 miles along the St. Andrew's and Quebec Railway. From Scotch Corner to Edmonston, the land is of excellent quality, and may be expected to increase slowly in population, as the lands are already in private hands.

One advantage of this line is that the part of Maine adjoining the boundary is rapidly filling up with inhabitants, nearly all the traffic of which would be attracted to this road. From Edmonston the line is the same as No. 2.

ALEXANDER L. LIGHT,

M. Inst. C. E.

Late Chief Engineer of Railways to the Provinces of New Brunswick and Nova Scotia.

HAVING gone carefully through all the points connected with the above railway with Mr. Light—such as summit-heights, crossings of rivers, and all other engineering points—I have no hesitation in stating that a line by either route indicated would be quite practicable. Having, also, had considerable experience as the engineer-in-chief of an extensive line in South America, and knowing from personal examination the nature of the country, which is in many respects similar to that of North America (climate and the value of labour, however, being much in favour of the latter,) I am of opinion that the estimates named by Mr. Light are ample, and his views upon the construction and completion of the line are very sound.

JAMES BRUNLEES,

5, VICTORIA STREET, WESTMINSTER,
3rd December, 1861.

M. Inst. C. E.

